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Maine Agricultural Experiment Station

BULLETIN No. 127.

MARCH, 1906.

FERTILIZER INSPECTION.

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This bulletin contains the analyses of manufacturers' samples of brands of fertilizers licensed before February 1, 1906. Dealers are cautioned to consult with the Station before offering brands not given in this bulletin.

Requests for bulletins should be addressed to the
AGRICULTURAL EXPERIMENT STATION,
Orono, Maine.

MAINE AGRICULTURAL EXPERIMENT STATION ORONO, MAINE.

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FERTILIZER INSPECTION.

CHAS. D. WOODS, Director.

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The law regulating the sale of commercial fertilizers in this State calls for two bulletins each year. The first of these contains the analyses of the samples received from the manufacturer, guaranteed to represent, within reasonable limits, the goods to be placed upon the market later. The second bulletin contains the analyses of the samples collected in the open market by a representative of the Station.

In the tables which follow the discussion there are given the results of the analyses of the manufacturers' samples of licensed brands. The tables include all the brands which have been licensed to February 1, 1906. Dealers are cautioned against handling any brands not given in this list without first writing the Station.

The figures which are given as the percentages of valuable ingredients guaranteed by the manufacturers are the minimum percentages of the guarantee. If, for instance, the guarantee is 2 to 3 per cent of nitrogen, it is evident that the dealer cannot be held to have agreed to furnish more than 2 per cent, and so this percentage is taken as actual guarantee. The figures under the head of "found" are those showing the actual composition of the samples.

The chief use of fertilizers is to supply plant-food. It is good farming to make the most of the natural resources of the soil and of the manures produced on the farm, and to depend upon artificial fertilizers only to furnish what more is needed. It is not good economy to pay high prices for materials which the soil may itself yield, but it is good economy to supply the lacking ones in the cheapest way. The rule in the purchase of costly commercial fertilizers should be to select those that supply, in the best forms and at the lowest cost, the plant-food which the crop needs and the soil fails to furnish.

Plants differ widely with respect to their capacities for gathering their food from soil and air; hence the proper fertilizer in a given case depends upon the crop as well as upon the soil.

The fertility of the soil would remain practically unchanged if all the ingredients removed in the various farm products were restored to the land. This may be accomplished by feeding the crops grown on the farm to animals, carefully saving the manure and returning it to the soil. If it is practicable to pursue a system of stock feeding in which those products of the farm which are comparatively poor in fertilizing constituents are exchanged in the market for feeding stuffs of high fertilizing value, the loss of soil fertility may be reduced to a minimum, or there may be an actual gain in fertility.

CONSTITUENTS OF FERTILIZERS.*

The only ingredients of plant-food which we ordinarily need to consider in fertilizers are potash, lime, sulphuric acid, phosphoric acid, and nitrogen. The available supply of sulphuric acid and lime is often insufficient; hence one reason for the good effect so often observed from the application of lime, and of plaster, which is a compound of lime and sulphuric acid. The remaining substances, nitrogen, phosphoric acid and potash, are the most important ingredients of our common commercial fertilizers, both because of their scarcity in the soil and their high cost. It is in supplying these that phosphates, bone manures, potash salts, guano, nitrate of soda, and most other commercial fertilizers are chiefly useful.

The term "form" as applied to a fertilizing constituent has reference to its combination or association with other constituents which may be useful, though not necessarily so. The form of the constituent, too, has an important bearing upon its availability, and hence upon its usefulness as plant food. Many materials containing the essential elements are practically worthless as sources of plant food because the form is not right; the plants are unable to extract them from their combinations; they are "unavailable." In many of these materials the forms may be changed by proper treatment, in which case they become valuable not because the element itself is changed, but because it then exists in such form as readily to feed the plant.

Nitrogen is the most expensive of the three essential fertilizing elements. It exists in three different forms, organic nitrogen, ammonia and nitrate.

* Farmers' Bulletin 44 of the U. S. Dept. of Agriculture, "Commercial Fertilizers, Composition and Use," can be had free by applying to your Congressman.

Organic nitrogen exists in combination with others elements either as vegetable or animal matter. All materials containing organic nitrogen are valuable in proportion to their rapidity of decay, because change of form must take place before the nitrogen can serve as food. Organic nitrogen differs in availability not only according to the kind of material which supplies it, but according to the treatment it receives. The nitrogen in the tables of analyses marked "insoluble in water" is organic nitrogen.

Nitrogen as ammonia usually exists in commercial manures in the form of sulphate of ammonia and is more readily available than organic nitrogen. While nitrogen in the form of ammonia is extremely soluble in water, it is not readily removed from the soil by leaching, as it is held by the organic compounds of the soil.

Nitrogen as nitrate exists in commercial products chiefly as nitrate of soda. Nitrogen in this form is directly and immediately available, no further changes being necessary. It is completely soluble in water, and diffuses readily throughout the soil. It differs from the ammonia compounds in forming no insoluble compounds with soil constituents and may be lost by leaching. The "nitrogen soluble in water" of the tables includes both the nitrogen as ammonia and as nitrate.

Phosphoric acid is derived from materials called phosphates, in which it may exist in combination with lime, iron, or alumina as phosphates of lime, iron or alumina. Phosphate of lime is the form most largely used as a source of phosphoric acid. Phosphoric acid occurs in fertilizers in three forms: That soluble in water and readily taken up by plants; that insoluble in water, but still readily used by plants, also known as "reverted;" and that soluble only in strong acids and consequently very slowly used by the plant. The "soluble" and "reverted" together constitute the "available" phosphoric acid. The phosphoric acid in natural or untreated phosphates is insoluble in water, and not readily available to plants. If it is combined with organic substance, as in animal bone, the rate of decay is more rapid than if with purely mineral substances. The insoluble phosphates may be converted into soluble forms by treatment with strong acids. Such products are known as acid phosphates or superphosphates. The "insoluble phosphoric acid" of a high cost commercial fertilizer has little or no value to

the purchaser because at the usual rate of application the quantity is too small to have any perceptible effect upon the crop, and because its presence in the fertilizer excludes an equal amount of more needful and valuable constituents.

Potash in commercial fertilizers exists chiefly as muriates and sulphates. With potash the form does not exert so great an influence upon availability as is the case with nitrogen and phosphoric acid. All forms are freely soluble in water, and are believed to be nearly if not quite equally available as food. The form of the potash has an important influence upon the quality of certain crops. For example, the results of experiments seem to indicate that the quality of tobacco, potatoes, and certain other crops is unfavorably influenced by the use of muriate of potash, while the same crops show a superior quality if materials free from chlorides have been used as the source of potash.

VALUATION OF FERTILIZERS.

The agricultural value of any fertilizing constituent is measured by the value of the increase of the crop produced by its use, and is, of course, a variable factor, depending upon the availability of the constituent, and the value of the crop produced. The form of the materials used must be carefully considered in the use of manures. Slow-acting materials cannot be expected to give profitable returns upon quick growing crops, nor expensive materials profitable returns when used for crops of relatively low value.

The agricultural value is distinct from what is termed "commercial value," or cost in market. This value is determined by market and trade conditions, as cost of production of the crude material, methods of manipulation required, etc. Since there is no strict relation between agricultural and commercial or market value, it may happen that an element in its most available form, and under ordinary conditions of high agricultural value, costs less in market than the same element in less available forms and of a lower agricultural value. The commercial value has reference to the material as an article of commerce, hence commercial ratings of various fertilizers have reference to their relative cost and are used largely as a means by which the different materials may be compared.

The commercial valuation of a fertilizer consists in calculating the retail trade-value or cash-cost at freight centers (in raw

material of good quality) of an amount of nitrogen, phosphoric acid and potash equal to that contained in one ton of the fertilizer. Plaster, lime, stable manure and nearly all of the less expensive fertilizers have variable prices, which bear no close relation to their chemical composition, but guanos, superphosphates, and similar articles, for which \$20 to \$45 per ton are paid, depend for their trade value exclusively on the substances, nitrogen, phosphoric acid and potash, which are comparatively costly and steady in price. The trade-value per pound of these ingredients is reckoned from the current market prices of the standard articles which furnish them to commerce. The consumer, in estimating the reasonable price to pay for high-grade fertilizers, should add to the trade-value of the above-named ingredients a suitable margin for the expenses of manufacture, etc., and for the convenience or other advantage incidental to their use.

TRADE VALUES OF FERTILIZING INGREDIENTS.

	Cents per pound
Nitrogen in nitrates.....	17
in ammonia salts.....	17½
Organic nitrogen in dry and fine ground fish, meat and blood, and in mixed fertilizers..	18½
in fine bone and tankage.....	18
in coarse bone and tankage.....	13
Phosphoric acid, water-soluble.....	4½
citrate-soluble	4
of fine ground bone and tankage....	4
of coarse bone and tankage.....	3
of cotten seed meal, castor pomace, and ashes	4
of mixed fertilizers, if insoluble in ammonium citrate.....	2
Potash as high grade sulphate and in forms free from muriate (or chlorides).....	5
as muriate	4½
as carbonate	8

A rule for calculating the commercial valuation of mixed fertilizers is given on page 64.

The results of the analyses of the manufacturers' samples of fertilizers are given on the pages which follow.

Descriptive List of Manufacturers' Samples, 1906.

Station number.	Manufacturer, place of business and brand.
AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK, N. Y.	
1001	A. A. C. Company, Aroostook Complete Manure.....
1002	A. A. C. Company, Aroostook High Grade
1003	Bradley's Alkaline Bone with Potash
1004	Bradley's Complete Manure for Potatoes and Vegetables
1005	Bradley's Complete Manure with 10% Potash.....
1006	Bradley's Corn Phosphate.....
1007	Bradley's Eureka Fertilizer
1008	Bradley's Niagara Phosphate.....
1009	Bradley's Potato Fertilizer
1010	Bradley's Potato Manure.....
1011	X. L. Superphosphate of Lime.....
1012	Clark's Cove Bay State Fertilizer.....
1013	Clark's Cove Bay State Fertilizer, G. G.
1014	Clark's Cove Bay State Fertilizer for Seeding Down
1015	Clark's Cove Deñance Complete Manure.....
1016	Clark's Cove Great Planet Manure, A. A.
1017	Clark's Cove King Phillips Alkaline Guano
1018	Clark's Cove Potato Fertilizer
1019	Clark's Cove Potato Manure.....
1020	Cleveland Fertilizer for all Crops.....
1021	Cleveland High Grade Complete Manure.....
1022	Cleveland Potato Phosphate
1023	Cleveland Seeding Down Fertilizer
1024	Cleveland Superphosphate.....
1025	Complete Manure with 10% Potash
1026	Crocker's Aroostook Potato Special.....
1027	Crocker's Ammoniated Corn Phosphate
1028	Crocker's Grass and Oats Fertilizer
1029	Crocker's High Grade.....
1030	Crocker's New Rival Ammoniated Superphosphate
1031	Crocker's Potato, Hop and Tobacco
1032	Crocker's Special Potato Manure.....
1033	Cumberland Guano for all Crops.....
1034	Cumberland Potato Fertilizer
1035	Cumberland Seeding Down Manure.....
1036	Cumberland Superphosphate
1037	Darling's Blood, Bone and Potash.....
1038	Fine Ground Bone.....
1039	Grass and Lawn Top Dressing.....
1040	Great Eastern General.....
1041	Great Eastern Grass and Oats Fertilizer.....
1042	Great Eastern High Grade Potato Manure.....
1043	Great Eastern Northern Corn Special
1044	Great Eastern Potato Manure.....
1045	Great Eastern Potato Special

Analyses of Manufacturers' Samples, 1906.

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
1001	% 1.01	% 1.40	% 2.41	% 2.47	% 3.08	% 3.20	% 2.00	% 6.28	% 6.00	% 8.28	%	% 10.04	% 10.00	
1002	2.88	1.62	4.50	4.12	4.31	2.21	2.83	6.52	7.00	9.35	.....	7.60	7.00
1003	.....	.....	.....	.....	5.34	4.18	3.64	9.52	11.00	13.16	12.00	2.49	2.00
1004	2.57	1.37	3.94	3.30	5.49	2.08	2.72	7.57	8.00	10.29	9.00	6.52	7.00	
1005	1.99	1.31	3.30	3.30	3.59	3.19	2.44	6.78	6.00	9.22	7.00	11.20	10.00	
1006	0.66	1.42	2.08	2.06	7.05	2.55	2.56	9.60	8.00	11.16	10.00	2.01	1.50	
1007	0.11	1.06	1.17	1.03	5.93	2.35	1.55	8.28	8.00	9.83	10.00	2.32	2.00	
1008	0.40	0.64	1.04	0.82	5.41	3.15	1.38	8.56	7.00	9.94	8.00	1.49	1.00	
1009	1.64	0.62	2.26	2.06	5.85	1.89	2.67	7.74	8.00	10.41	10.00	3.13	3.00	
1010	1.29	1.44	2.73	2.50	5.42	0.79	2.48	6.21	6.00	8.69	8.00	4.96	5.00	
1011	1.45	1.13	2.58	2.50	6.62	2.54	3.25	9.16	9.00	12.41	11.00	2.34	2.00	
1012	1.45	1.07	2.52	2.50	6.67	2.39	3.59	9.06	9.00	12.65	11.00	2.34	2.00	
1013	1.58	0.74	2.32	2.06	5.42	2.39	3.32	7.81	8.00	11.13	10.00	1.85	1.50	
1014	0.41	0.74	1.45	1.03	5.93	2.80	2.42	8.73	8.00	11.15	10.00	2.57	2.00	
1015	0.40	0.68	1.08	0.82	5.24	2.74	1.48	7.98	7.00	9.46	8.00	1.59	1.00	
1016	1.88	1.52	3.40	3.30	5.20	3.01	1.96	8.21	8.00	10.17	9.00	7.43	7.00	
1017	0.43	0.68	1.11	1.03	5.71	2.67	1.47	8.38	8.00	9.85	10.00	2.12	2.00	
1018	1.76	0.56	2.32	2.06	5.92	1.98	2.74	7.90	8.00	10.64	10.00	3.30	3.00	
1019	0.56	2.11	2.67	2.50	3.96	3.03	3.49	6.99	6.00	10.48	8.00	5.59	5.00	
1020	0.34	0.72	1.06	1.03	5.50	2.87	2.60	8.37	8.00	10.97	10.00	2.30	2.00	
1021	2.32	1.33	3.65	3.30	5.63	2.11	2.69	7.74	8.00	10.43	9.00	6.74	7.00	
1022	1.63	0.56	2.19	2.06	6.06	1.74	2.73	7.80	8.00	10.53	10.00	3.17	3.00	
1023	0.11	1.06	1.17	1.03	5.79	2.89	1.27	8.68	8.00	9.95	10.00	2.20	2.00	
1024	0.66	1.40	2.06	2.06	7.17	2.35	2.62	9.52	8.00	12.14	10.00	2.03	1.50	
1025	1.99	1.46	3.45	3.30	4.31	1.95	2.07	6.26	6.00	8.33	7.00	9.55	10.00	
1026	0.81	1.29	2.10	2.06	5.17	3.33	2.03	8.50	8.00	10.53	.....	6.61	6.00
1027	0.26	2.06	2.32	2.06	4.82	3.65	3.87	8.17	8.00	12.04	.....	2.26	1.50
1028	.....	.....	.....	.....	7.54	4.28	1.79	11.82	11.00	13.61	.....	2.03	2.00
1029	1.79	1.52	3.31	3.29	5.87	2.41	2.50	8.28	8.00	10.78	.....	7.41	7.00
1030	0.23	1.14	1.37	1.03	4.82	3.70	2.47	8.52	8.00	10.99	.....	2.12	2.00
1031	1.10	1.10	2.20	2.06	5.98	2.07	2.68	8.05	8.00	10.73	.....	3.34	3.00
1032	2.01	1.30	3.31	3.29	3.84	3.29	2.34	7.13	6.00	9.47	.....	10.80	10.00
1033	0.03	1.23	1.26	1.03	6.22	3.00	2.49	9.22	8.00	11.71	10.00	2.28	2.00	
1034	0.72	1.34	2.06	2.06	6.13	4.17	2.33	10.30	8.00	12.63	10.00	3.38	3.00	
1035	0.44	0.72	1.16	1.03	5.42	2.98	2.53	8.40	8.00	10.93	10.00	2.53	2.00	
1036	1.64	0.74	2.38	2.06	5.30	2.56	3.18	7.86	8.00	11.04	10.00	1.89	1.50	
1037	2.76	1.40	4.16	4.10	4.98	1.90	2.48	6.88	7.00	9.36	8.00	7.16	7.00	
1038	.....	.....	2.50	2.47	.....	.....	.....	.....	.....	25.31	22.80	.....	.....
1039	4.44	0.08	4.52	3.91	1.03	5.16	0.97	7.69	5.00	8.66	6.00	3.56	2.00	
1040	0.52	0.96	1.48	0.82	5.17	2.42	3.05	7.59	8.00	10.64	.....	4.73	4.00
1041	.....	.....	.....	.....	4.11	6.88	4.08	10.99	11.00	15.07	.....	2.15	2.00
1042	2.38	1.00	3.38	3.29	4.87	3.25	1.86	8.12	6.00	9.98	.....	10.64	10.00
1043	0.42	1.84	2.26	2.06	5.02	4.60	2.35	9.62	8.00	11.98	.....	2.26	1.50
1044	0.85	1.23	2.08	2.06	5.92	2.31	2.76	8.23	8.00	10.99	.....	3.37	3.00
1045	1.68	1.62	3.30	3.29	5.87	2.27	2.56	8.14	8.00	10.70	.....	7.57	7.00

Descriptive List of Manufacturers' Samples, 1906.

Station number.	Manufacturer, place of business and brand.
1046	High Grade Fertilizer with 10% Potash
1047	High Grade Sulphate of Potash
1048	Lazaretto Aroostook Potato Guano
1049	Lazaretto Corn Guano
1050	Lazaretto High Grade Potato Manure.....
1051	Lazaretto Propeller Potato Guano
1052	Lazaretto Special Potato Manure.....
1053	Murlate of Potash
1054	Nitrate of Soda.....
1055	Otis' Potato Fertilizer
1056	Otis' Seeding Down Fertilizer.....
1057	Otis' Superphosphate
1058	Pacific Dissolved Bone and Potash.....
1059	Pacific Grass and Grain Fertilizer.....
1060	Pacific High Grade General Fertilizer
1061	Pacific Nobesque Guano
1062	Pacific Potato Special.....
1063	Packer's Union Animal Corn Fertilizer.....
1064	Packer's Union Economical Vegetable Guano....
1065	Packer's Union Gardiner's Complete Manure.....
1066	Packer's Union High Grade
1067	Packer's Union Potato Manure
1068	Packer's Union Universal Fertilizer
1069	Packer's Union Wheat, Oats and Clover Fertilizer.....
1070	Plain Superphosphate
1071	Quinnipiac Climax Phosphate for all Crops
1072	Quinnipiac Corn Manure.....
1073	Quinnipiac Market Garden Manure
1074	Quinnipiac Mohawk Fertilizer.....
1075	Quinnipiac Potato Manure
1076	Quinnipiac Potato Phosphate.....
1077	Read's Farmers' Friend
1078	Read's High Grade Farmers' Friend.....
1079	Read's Potato Manure.....
1080	Read's Practical Potato Special.....
1081	Read's Standard Superphosphate.....
1082	Read's Sure Catch Fertilizer.....
1083	Read's Vegetable and Vine Fertilizer
1084	Soluble Pacific Guano.....
1085	Standard A Brand
1086	Standard Bone and Potash
1087	Standard Complete Manure.....
1088	Standard Fertilizer.....
1089	Standard Guano for all Crops
1090	Standard Special for Potatoes.....
1091	Williams and Clark's Americus Ammoniated Bone Superphosphate.....
1092	Williams and Clark's Americus Corn Phosphate.....
1093	Williams and Clark's Americus High Grade Special.....

Analyses of Manufacturers' Samples, 1906.

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
1046	% 1.50	% 1.03	% 2.53	% 2.40	% 5.82	% 1.76	% 2.63	% 7.58	% 6.00	% 10.21	% 7.00	% 10.44	% 10.00	
1047	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49.80	48.00
1048	0.19	0.78	0.97	0.82	5.69	3.36	2.11	9.05	8.00	11.16	.....	4.57	4.00
1049	0.95	1.02	1.97	1.64	4.47	3.20	2.74	7.67	8.00	10.41	.....	2.53	2.00
1050	1.21	1.82	3.03	3.29	4.00	1.90	2.27	5.90	6.00	8.17	.....	10.60	10.00
1051	0.70	1.30	2.00	2.06	5.69	2.56	2.88	8.25	8.00	11.13	.....	6.52	6.00
1052	1.69	1.56	3.25	3.29	5.85	2.27	2.55	8.12	8.00	10.67	.....	7.70	7.00
1053	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49.63	50.00
1054	15.12	.....	15.12	15.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
1055	1.74	0.58	2.32	2.06	5.74	2.28	2.46	8.02	8.00	10.48	10.00	3.05	3.00	
1056	0.37	0.78	1.15	1.03	5.95	2.03	2.83	7.98	8.00	10.81	10.00	2.01	2.00	
1057	0.68	1.38	2.06	2.06	6.94	2.92	2.43	9.86	8.00	12.29	10.00	2.16	1.50	
1058	.....	.....	.....	.....	5.98	4.81	1.91	10.79	10.00	12.70	11.00	2.43	2.00
1059	0.42	0.64	1.06	0.82	5.46	3.01	1.43	8.47	7.00	9.90	8.00	2.99	1.00	
1060	2.13	1.41	3.54	3.30	5.15	2.92	2.14	8.07	8.00	10.21	9.00	7.18	7.00	
1061	0.45	0.80	1.25	1.03	5.53	2.31	2.73	7.84	8.00	10.57	10.00	2.14	2.00	
1062	0.76	1.34	2.10	2.06	5.69	4.27	2.70	9.96	8.00	12.66	10.00	3.15	3.00	
1063	0.31	2.10	2.41	2.47	5.64	3.22	3.46	8.86	9.00	12.32	.....	1.91	2.00
1064	0.26	1.47	1.68	1.25	4.65	2.55	2.15	7.20	6.00	9.35	.....	3.59	3.00
1065	1.38	1.16	2.54	2.47	5.58	0.47	2.06	6.05	6.00	8.11	.....	10.99	10.00
1066	1.75	1.56	3.31	3.29	5.85	2.41	2.55	8.26	8.00	10.81	.....	7.53	7.00
1067	0.96	1.10	2.06	2.06	4.85	3.16	1.85	8.01	8.00	9.86	.....	6.54	6.00
1068	0.25	0.96	1.21	0.82	6.05	3.22	1.46	9.27	8.00	10.73	.....	5.04	4.00
1069	.....	.....	.....	.....	.....	.....	1.20	10.92	11.00	12.12	.....	2.39	2.00
1070	.....	.....	.....	.....	10.21	3.91	1.30	14.12	14.00	15.42	15.00	.....	.....
1071	0.39	1.06	1.45	1.03	5.10	3.54	1.63	8.64	8.00	10.27	10.00	2.91	2.00	
1072	0.67	1.38	2.05	2.06	6.69	2.63	2.41	9.32	8.00	11.73	10.00	1.95	1.50	
1073	2.19	1.38	3.58	3.30	4.23	4.67	1.47	8.90	8.00	10.37	9.00	7.57	7.00	
1074	0.03	0.83	0.86	0.82	2.60	4.87	3.86	7.47	7.00	11.33	8.00	1.58	1.00	
1075	1.03	1.50	2.53	2.50	2.55	4.03	3.06	6.58	6.00	9.64	8.00	5.15	5.00	
1076	0.74	1.30	2.04	2.06	5.61	4.71	2.36	10.32	8.00	12.68	10.00	3.34	3.00	
1077	1.57	0.62	2.19	2.06	5.84	2.08	2.59	7.92	8.00	10.51	10.00	3.11	3.00	
1078	2.23	1.48	3.71	3.30	3.96	2.13	2.08	6.09	6.00	8.17	7.00	9.59	10.00	
1079	0.42	2.28	2.70	2.40	4.59	1.89	1.25	6.48	6.00	7.73	7.00	10.94	10.00	
1080	0.42	0.74	1.16	0.82	1.64	2.56	1.99	4.20	4.00	6.19	5.00	8.03	8.00	
1081	0.10	0.94	1.04	0.82	5.87	2.89	2.23	8.76	8.00	10.99	10.00	4.81	4.00	
1082	.....	.....	.....	.....	5.42	3.90	3.09	9.32	10.00	12.41	11.00	2.59	2.00
1083	0.32	1.80	2.12	2.06	5.94	2.25	1.38	8.29	8.00	9.67	10.00	6.35	6.00	
1084	1.58	0.80	2.38	2.06	5.18	2.81	3.01	8.09	8.00	11.10	10.00	1.89	1.50	
1085	0.31	0.90	1.21	0.82	3.64	4.10	2.08	7.74	7.00	9.82	8.00	1.56	1.00	
1086	.....	.....	.....	.....	7.66	2.60	1.96	10.26	10.00	12.22	11.00	2.08	2.00
1087	2.40	0.90	3.30	3.30	7.02	1.99	1.04	8.81	8.00	9.85	9.00	7.56	7.00	
1088	1.60	0.78	2.38	2.06	5.14	2.41	3.36	7.55	8.00	10.91	10.00	1.70	1.50	
1089	0.37	0.70	1.07	1.03	5.31	3.03	1.44	8.34	8.00	9.74	10.00	2.10	2.00	
1090	1.68	0.62	2.30	2.06	5.82	2.22	2.45	8.04	8.00	10.49	10.00	3.17	3.00	
1091	1.40	1.35	2.75	2.50	5.52	2.65	3.44	8.17	9.00	11.61	11.00	2.78	2.00	
1092	1.35	0.76	2.11	2.06	5.58	2.78	3.04	8.36	8.00	11.40	10.00	1.99	1.50	
1093	2.36	1.33	3.69	3.30	5.57	2.56	2.48	8.13	8.00	10.61	9.00	6.54	7.00	

Descriptive List of Manufacturers' Samples, 1906.

Station number.	Manufacturer, place of business and brand.	
1094	Williams and Clark's Americus Potato Manure.....	
1095	Williams and Clark's Royal Bone Phosphate for all Crops	
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.	
1096	All Soluble.....	
1097	Bone, Blood and Potash	
1098	Grain Grower.....	
1099	High Grade Potato	
1100	Wheat, Corn and Oats.....	
	BOWKER FERTILIZER CO., BOSTON, MASS.	
1101	Bowker's Bone, Blood and Potash.....	
1102	Bowker's Bone and Potash Square Brand	
1103	Bowker's Corn Phosphate	
1104	Bowker's Early Potato Manure	
1105	Bowker's Farm and Garden Phosphate	
1106	Bowker's Fresh Ground Bone.....	
1107	Bowker's Hill and Drill Phosphate	
1108	Bowker's Market Garden Phosphate.....	
1109	Bowker's Potash Bone.....	
1110	Bowker's Potash or Staple Phosphate.....	
1111	Bowker's Potato and Vegetable Fertilizer.....	
1112	Bowker's Potato and Vegetable Phosphate.....	
1113	Bowker's Six Per Cent Potato Fertilizer	
1114	Bowker's Superphosphate with Potash for Grass and Grain	
1115	Bowker's Sure Crop Phosphate	
1116	Bowker's Ten Per Cent Manure.....	
1117	Monticello Grange Chemicals.....	
1118	Special Potato Manure for the Grange.....	
1119	Stockbridge Special Manure (for Corn, etc.) Class D 107	
1120	Stockbridge Special Manure (for Grass, etc.) Class F 56	
1121	Stockbridge Special Manure (for Potatoes, etc.) Class D 610	
1122	Stockbridge Special Manure (for Seeding Down, etc.) Class C 610.....	
	COE-MORTIMER CO., NEW YORK, N. Y.	
1123	E. Frank Coe's Celebrated Special Potato Fertilizer.....	
1124	E. Frank Coe's Columbian Corn Fertilizer.....	
1125	E. Frank Coe's Columbian Potato Fertilizer.....	
1126	E. Frank Coe's Excelsior Potato Fertilizer.....	
1127	E. Frank Coe's Grass and Grain Special.....	
1128	E. Frank Coe's High Grade Ammoniated Bone Superphosphate	
1129	E. Frank Coe's High Grade Potato Fertilizer.....	
1130	E. Frank Coe's New Englander Corn Fertilizer.....	
1131	E. Frank Coe's New Englander Special Potato Fertilizer	
1132	E. Frank Coe's Prize Brand Grain and Grass Fertilizer	
1133	E. Frank Coe's Red Brand Excelsior Guano	
1134	E. Frank Coe's Standard Grade Ammoniated Bone Superphosphate	
	HUBBARD FERTILIZER CO., OF BALTIMORE, BALTIMORE, MD.	
1137	Huhhard's Bone, Blood and Potash.....	
1138	Huhhard's Royal Ensign	
	JOHN WATSON COMPANY, HOULTON, ME.	
1141	Watson's Improved High Grade Potato Manure	

Analyses of Manufacturers' Samples, 1906.

Station number.	NITROGEN.				PHOSPHORIC ACID.						POTASH.		
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.		
1094	% 1.68	% 0.60	% 2.28	% 2.06	% 6.17	% 2.02	% 2.48	% 8.19	% 8.00	% 10.67	% 10.00	% 3.28	% 3.00
1095	0.29	0.82	1.11	1.03	5.47	3.14	2.55	8.61	8.00	11.16	10.00	2.59	2.00
1096	1.40	1.80	3.20	2.88	5.61	1.95	1.82	7.56	8.00	9.38	10.00	3.88	4.00
1097	2.34	2.21	4.55	4.11	6.67	1.47	1.01	8.24	8.00	9.25	10.00	8.40	7.00
1098	0.94	0.72	1.66	1.65	5.61	2.35	1.26	7.96	8.00	9.22	10.00	2.51	2.00
1099	0.66	1.31	1.97	1.65	6.97	1.36	1.34	8.33	8.00	9.67	10.00	9.84	10.00
1100	0.22	0.60	0.82	0.82	5.04	2.24	2.02	7.28	7.00	9.30	9.00	1.24	1.00
1101	2.21	1.75	3.36	4.10	3.27	4.83	2.11	8.10	8.00	10.21	10.00	6.77	7.00
1102	1.03	0.81	1.84	1.65	1.04	3.68	7.10	4.72	6.00	11.82	7.00	2.34	2.00
1103	0.40	1.14	1.54	1.65	2.27	5.90	2.19	8.17	8.00	10.36	9.00	2.52	2.00
1104	1.19	1.95	3.14	3.29	3.57	3.49	2.23	7.06	7.00	9.29	8.00	7.33	7.00
1105	0.52	1.16	1.68	1.65	2.20	6.62	2.50	8.92	8.00	11.42	9.00	2.80	2.00
1106	.....	.....	2.50	2.47	.....	.....	.....	.....	.....	19.09	18.00	.....	.....
1107	0.71	1.73	2.44	2.47	3.27	5.48	2.76	8.75	9.00	11.51	10.00	2.16	2.00
1108	1.59	0.79	2.38	2.47	5.55	2.12	1.34	7.67	6.00	9.01	7.00	9.85	10.00
1109	0.90	.....	0.90	0.82	3.05	1.93	3.03	4.98	6.00	8.01	7.00	2.10	2.00
1110	0.18	0.74	0.92	0.82	1.69	6.43	2.15	8.12	8.00	10.27	9.00	3.37	3.00
1111	0.61	1.73	2.34	2.47	7.26	2.32	0.83	9.58	8.00	10.41	10.00	4.30	4.00
1112	0.30	1.18	1.48	1.65	2.28	6.79	2.31	9.07	9.00	11.38	10.00	2.32	2.00
1113	0.35	0.65	1.00	0.82	1.39	4.82	3.05	6.21	6.00	9.26	7.00	6.48	6.00
1114	.....	.....	.....	.....	4.39	5.30	1.71	9.69	10.00	11.40	11.00	2.84	2.00
1115	0.35	0.72	1.07	0.82	4.93	3.50	2.42	8.43	9.00	10.88	10.00	2.37	2.00
1116	0.17	0.69	0.86	0.82	1.29	3.92	1.99	5.21	5.00	7.20	6.00	10.34	10.00
1117	1.15	1.09	2.24	2.50	5.34	2.80	1.67	8.14	8.00	9.81	12.00	4.17	4.00
*1118	.....	.....	.....	1.50	.....	.....	.....	.....	9.00	.....	12.00	.....	12.00
1119	1.93	1.40	3.33	3.29	7.89	2.30	0.91	10.19	10.00	11.10	11.00	7.39	7.00
1120	3.18	1.88	5.06	4.94	3.01	2.69	2.26	5.70	4.00	7.96	6.00	6.11	6.00
1121	1.32	1.88	3.20	3.29	2.57	3.54	2.27	6.11	6.00	8.38	7.00	10.34	10.00
1122	0.79	1.59	2.38	2.47	2.97	2.88	4.24	5.85	6.00	10.09	9.00	10.04	10.00
1123	1.26	0.62	1.88	1.65	7.34	1.19	2.71	8.53	8.00	11.24	10.00	4.73	4.00
1124	0.60	0.74	1.34	1.23	7.29	2.77	2.53	9.46	8.50	12.01	10.50	2.98	2.50
1125	0.54	0.80	1.34	1.23	6.30	2.16	2.49	9.46	8.50	11.95	10.50	3.08	2.50
1126	1.46	0.96	2.41	2.47	6.03	1.97	2.22	8.00	7.00	10.22	9.00	9.35	8.00
1127	0.07	0.73	0.80	0.80	6.73	2.57	2.81	9.30	8.50	12.11	.....	2.28	1.50
1128	1.02	1.06	2.08	1.85	6.76	2.26	2.30	9.02	9.00	11.32	11.00	3.09	2.25
1129	1.68	0.92	2.60	2.40	7.15	1.53	2.76	8.68	8.00	11.44	10.00	6.48	6.00
1130	0.63	0.70	1.33	0.80	7.15	2.42	2.60	9.57	7.50	12.17	9.00	3.11	3.00
1131	0.37	0.66	1.03	0.80	6.09	2.36	2.78	8.45	7.50	11.23	9.00	3.28	3.00
1132	.....	.....	.....	.....	6.64	3.96	3.06	10.55	10.50	13.61	12.00	2.59	2.00
1133	2.30	1.07	3.37	3.30	7.59	2.14	1.77	9.73	9.00	11.50	10.00	6.74	6.00
1134	0.63	0.56	1.19	1.20	6.03	2.50	2.70	8.53	8.50	11.23	10.00	3.90	2.00
1137	1.60	2.12	3.72	3.29	9.14	0.48	0.76	9.62	8.00	10.38	9.00	9.09	7.00
1138	1.58	1.36	2.94	2.47	8.80	1.08	0.55	9.88	8.00	10.43	9.00	4.55	4.00
1141	1.74	1.27	3.01	3.00	4.29	2.12	4.02	6.41	6.00	10.43	7.00	5.25	5.00

* Sample received too late for analysis.

Descriptive List of Manufacturers' Samples, 1906.

Station number.	Manufacturer, place of business and brand.
	LISTER'S AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.
1142	Lister's Animal Bone and Potash
1143	Lister's Bone Meal
1144	Lister's High Grade Special for Spring Crops
1145	Lister's Oneida Special
1146	Lister's Potato Manure
1147	Lister's Special Corn Fertilizer
1148	Lister's Special Potato Fertilizer
1149	Lister's Success Fertilizer
1150	Lister's 10% Potato Grower
	NATIONAL FERTILIZER CO., BRIDGEPORT, CONN.
1151	Chittenden's Complete Root
1152	Chittenden's Excelsior Potato Fertilizer
1153	Chittenden's Eureka Potato Fertilizer
1154	Chittenden's Market Garden
	NEW ENGLAND FERTILIZER CO., BOSTON, MASS.
1155	New England Complete Manure
1156	New England Corn and Grain Fertilizer
1157	New England Corn Phosphate
1158	New England High Grade Potato Fertilizer
1159	New England High Grade Special with 10 Per Cent Potash
1160	New England Potato Fertilizer
1161	New England Potato Grower
1162	New England Market Garden Manure
1163	New England Superphosphate
	OLDS & WHIPPLE, HARTFORD, CONN.
1164	"Excelsior" Potato Fertilizer
	PARMENTER & POLSLEY FERTILIZER CO., PEABODY, MASS.
1166	A. A. Brand
1167	Aroostook Special
1168	Ground Bone
1169	Muriate of Potash
1170	Nitrate of Soda
1171	P. & P. Grain Grower
1172	P. & P. Potato
1173	Plymouth Rock
1174	Special Potato
1175	Star Brand
	PORTLAND RENDERING CO., PORTLAND, MAINE.
1176	Bone Dust Tankage
	PROVINCIAL CHEMICAL FERTILIZER CO., ST. JOHN, N. B.
1177	Special Potato Phosphate
1178	10% Complete "Aroostook" Potato
	R. T. PRENTISS CO., PRESQUE ISLE, MAINE.
1179	Prentiss Aroostook Complete
1180	Prentiss Aroostook Special
1181	Prentiss Aroostook Standard
	TUSCARORA FERTILIZER CO., BALTIMORE.
1214	Tuscarora Fruit and Potato
	RUSSIA CEMENT CO., GLOUCESTER, MASS.
1182	Essex A1 Superphosphate
1183	Essex Aroostook County Special Potato Manure
1184	Essex Complete Manure for Aroostook County Crops

Analyses of Manufacturers' Samples, 1906.

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
	%	%	%	%	%	%	%	%	%	%	%	%	%	
1142	.....	.....	.....	.....	6.44	3.84	2.19	10.28	11.00	12.47	12.00	2.26	2.00
*1143	.....	.....	.....	2.68	.....	.....	.....	.....	.....	.....	23.00	.....	.....
1144	0.45	1.50	1.95	1.65	3.75	4.34	3.07	8.09	8.00	11.16	9.20	11.16	10.00	
1145	0.34	0.83	1.17	0.83	4.42	3.71	2.48	8.13	7.00	10.61	8.00	1.16	1.00	
1146	1.92	1.25	3.17	3.30	5.50	2.46	3.09	7.96	8.00	11.05	9.00	7.22	7.09	
1147	0.70	1.12	1.82	1.65	5.63	3.72	2.39	9.35	8.00	11.74	9.00	3.66	3.00	
1148	0.64	1.22	1.86	1.65	5.66	3.94	2.19	9.60	8.00	11.79	9.00	3.52	3.00	
1149	0.31	0.99	1.30	1.25	6.16	3.02	2.58	9.18	9.09	11.76	11.00	2.37	2.00	
1150	1.36	1.64	3.00	3.30	4.39	2.17	2.58	6.56	6.00	9.14	.....	9.57	10.00
1151	1.71	1.73	3.44	3.30	6.51	1.49	1.78	8.00	8.00	9.78	10.00	6.01	6.00	
1152	1.80	1.76	3.56	3.30	4.08	1.88	1.85	5.96	6.00	7.81	8.00	10.56	10.00	
1153	0.85	1.78	2.63	2.40	4.19	1.46	1.75	5.65	6.00	7.40	8.00	10.48	10.00	
1154	1.16	1.26	2.42	2.40	3.70	2.49	2.17	6.19	6.00	8.36	8.00	5.63	5.00	
1155	1.91	1.48	3.39	3.28	3.45	3.14	3.57	6.59	6.00	10.16	7.00	10.04	10.00	
1156	0.44	0.76	1.20	1.22	5.66	1.40	0.55	7.06	7.00	7.61	.....	2.05	2.00
1157	0.76	1.02	1.78	1.64	3.85	4.93	1.33	8.78	8.00	10.11	9.00	3.23	3.00	
1158	1.28	1.20	2.48	2.45	5.65	2.38	2.16	8.03	8.00	10.19	9.00	6.18	6.00	
1159	2.32	1.40	3.72	3.69	5.38	3.53	1.17	8.91	7.00	9.08	8.00	10.54	10.00	
1160	0.88	0.88	1.76	1.64	3.46	4.89	0.98	8.35	7.00	9.33	8.00	4.28	4.00	
1161	1.38	1.16	2.54	2.46	3.45	2.59	2.40	6.04	6.00	8.44	7.00	10.33	10.00	
1162	2.11	1.90	4.01	4.10	3.27	3.94	4.11	7.21	7.00	11.32	8.00	7.68	7.00	
1163	1.24	1.24	2.48	2.46	7.58	1.63	1.05	9.21	9.00	10.26	10.00	4.54	4.00	
1164	1.26	2.22	3.48	3.30	0.48	5.73	2.02	6.21	6.00	8.23	.....	9.40	10.00
1166	2.93	0.92	3.85	4.10	2.81	4.75	0.64	7.56	7.00	8.20	8.00	8.79	8.00	
1167	2.49	1.16	3.65	3.29	4.33	3.21	0.66	7.54	7.00	8.20	8.00	10.33	10.00	
1168	.....	.....	1.80	2.47	.....	.....	.....	.....	5.00	20.13	23.00	.....	.....
1169	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50.28	50.00
1170	15.42	.....	15.42	14.81	.....	.....	.....	.....	.....	.....	.....	.....	.....
1171	0.59	0.61	1.20	0.82	3.30	4.45	4.32	7.75	7.00	12.07	8.00	2.70	2.00	
1172	1.00	0.84	1.84	1.64	2.36	5.15	0.99	7.51	6.00	8.56	7.00	6.91	6.00	
1173	0.21	2.08	2.29	2.47	3.81	4.21	1.38	8.02	8.00	9.40	9.00	4.19	4.00	
1174	1.69	1.29	2.98	3.29	4.21	4.27	1.29	8.48	8.00	9.77	9.00	7.41	7.00	
1175	1.01	0.79	1.80	1.64	3.80	3.54	1.15	7.34	7.00	8.49	8.00	2.60	2.50	
1176	1.00	3.74	4.74	5.50	.....	.....	.....	.....	.....	17.86	16.00	.....	.....
1177	1.06	1.08	2.14	2.00	7.73	1.13	4.30	8.86	8.00	13.16	.....	6.15	6.00
1178	3.39	0.76	4.15	3.29	6.83	1.11	0.87	8.00	8.00	8.87	.....	11.55	10.00
1179	2.21	1.14	3.35	3.29	4.56	1.70	1.38	6.26	6.00	7.64	8.00	11.16	10.00	
1180	1.96	1.06	3.02	2.88	6.20	1.86	1.11	8.06	7.00	9.17	8.00	8.80	8.00	
1181	1.70	0.92	2.62	2.47	6.43	1.86	1.15	8.29	6.00	9.44	8.00	5.79	5.00	
*1214	.....	.....	.....	1.65	.....	.....	.....	.....	8.00	.....	10.00	.....	12.00
1182	0.18	1.34	1.52	1.00	1.96	5.32	4.93	7.29	7.00	12.22	9.00	2.11	2.00	
1183	1.03	1.64	2.67	2.40	1.71	4.14	4.48	5.85	7.00	10.33	8.00	4.65	5.00	
1184	0.84	2.11	2.95	3.30	5.02	2.24	3.89	7.26	7.00	11.15	9.00	9.23	9.50	

* Sample received too late for analysis.

Descriptive List of Manufacturers' Samples, 1906.

Station number.	Manufacturer, place of business and brand.
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1185	Essex Complete Manure for Corn, Grain and Grass.....
1186	Essex Complete Manure for Potatoes, Roots and Vegetables.....
1187	Essex Market Garden and Potato Manure.....
1188	Essex XXX Fish and Potash.....
	SAGADAHOC FERTILIZER CO., BOWDOINHAM, ME.
1189	Acid Phosphate.....
1190	Aroostook Potato Manure.....
1191	Dirigo Fertilizer.....
1192	Muriate of Potash.....
1193	Nitrate of Soda.....
1194	Sagadahoc High Grade Superphosphate.....
1195	Sagadahoc Special Potato Fertilizer.....
1196	XX Chemical Fertilizer.....
1197	Yankee Fertilizer.....
1200	3-6-10 Fertilizer.....
	SCIENTIFIC FERTILIZER CO., BUFFALO, N. Y.
1201	Scientific "Bone, Meat and Potash" Fertilizer.....
1202	Scientific "Corn and Grain" Fertilizer.....
1203	Scientific "Economy" Fertilizer.....
1204	Scientific "Potato" Fertilizer.....
1205	Scientific "Potato and Vegetable" Fertilizer.....
	SWIFT'S LOWELL FERTILIZER CO., BOSTON, MASS.
1206	Swift's Lowell Animal Brand.....
1207	Swift's Lowell Bone Fertilizer.....
1208	Swift's Lowell Cereal Fertilizer.....
1209	Swift's Lowell Dissolved Bone and Potash.....
1210	Swift's Lowell Empress Brand.....
1211	Swift's Lowell Potato Manure.....
1212	Swift's Lowell Potato Phosphate.....
1213	Swift's Lowell Superior Fertilizer.....

Analyses of Manufacturers' Samples, 1906.

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
1185	% 0.97	% 2.91	% 3.88	% 3.30	% 5.90	% 3.75	% 1.50	% 9.65	% 7.00	% 11.15	% 9.50	% 9.36	% 9.50	
1186	0.96	3.22	4.18	3.70	6.33	2.62	3.14	8.95	7.00	12.09	9.00	8.39	8.50	
1187	0.79	1.55	2.34	2.00	5.25	5.17	2.65	10.42	8.00	13.07	10.00	5.06	5.00	
1188	0.56	1.82	2.38	2.10	6.14	2.70	3.28	8.84	9.00	12.12	12.00	4.11	2.25	
1189	.....	.....	.....	.....	16.86	0.95	0.80	17.81	16.00	18.61	17.00	.....	.....
1190	0.92	0.08	1.00	1.05	7.11	1.44	0.45	8.55	6.00	9.00	7.00	4.97	4.00	
1191	0.13	0.44	0.57	0.85	6.62	0.89	5.46	7.51	6.00	12.97	9.00	3.32	3.00	
1192	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53.20	50.00
1193	15.58	.....	15.58	15.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
1194	1.54	0.38	1.92	1.85	6.86	1.14	3.50	8.00	7.00	11.50	8.00	4.37	3.00	
1195	1.33	0.58	1.91	2.00	4.63	1.66	4.54	6.29	7.00	10.83	8.00	9.83	8.00	
1196	7.03	1.07	8.10	7.00	.....	.....	3.76	4.29	3.00	8.05	7.00	10.05	8.00
1197	0.35	0.41	0.76	0.40	7.30	2.73	1.04	10.03	7.00	11.07	8.00	3.05	2.00	
*1200	.....	.....	.....	2.47	.....	.....	.....	.....	6.00	.....	7.00	.....	10.00
1201	0.70	2.32	3.02	3.33	4.43	1.55	3.14	5.98	8.00	9.12	10.00	8.55	8.00	
1202	0.52	1.32	1.87	1.66	5.55	1.71	1.51	7.26	8.00	8.77	9.00	2.47	2.00	
1203	0.52	1.24	1.76	1.66	6.16	1.71	1.64	7.87	9.00	8.51	10.00	4.16	4.00	
1204	0.71	1.92	2.63	2.50	4.26	1.20	2.70	5.46	8.00	8.16	10.00	6.23	6.00	
1205	0.68	2.62	3.30	3.33	4.12	1.99	3.70	6.11	7.00	8.87	8.00	10.62	10.00	
1206	0.86	1.46	2.32	2.46	7.85	1.34	0.94	9.19	9.00	10.13	10.00	4.56	4.00	
1207	0.73	0.94	1.67	1.64	5.26	2.76	1.79	8.02	8.00	9.81	9.00	3.20	3.00	
1208	0.34	0.50	0.84	0.82	5.22	1.76	1.32	6.98	7.00	8.30	8.00	1.18	1.00	
1209	0.54	1.08	1.62	1.64	7.11	1.65	1.02	8.76	9.00	9.78	10.00	2.14	2.00	
1210	0.35	0.77	1.12	1.23	6.03	1.12	0.66	7.15	7.00	7.81	8.00	2.11	2.00	
1211	0.56	0.96	1.52	1.64	4.52	2.34	1.40	6.89	7.00	8.29	8.00	4.24	4.00	
1212	1.31	1.16	2.47	2.46	5.66	2.49	1.71	8.15	8.00	9.86	9.00	6.35	6.00	
1213	2.52	1.28	3.80	3.69	5.60	1.98	1.30	7.58	7.00	8.88	8.00	10.23	10.00	

* Sample received too late for analysis.

RULE FOR CALCULATING VALUATION OF FERTILIZERS.

The commercial valuation will be accurate enough as a means of comparison if the following rule is adopted:

Multiply 3.5 by the percentage of nitrogen.

Multiply 0.8 by the percentage of available phosphoric acid.

Multiply 0.4 by the percentage of insoluble phosphoric acid.

Multiply 1.0 by the percentage of potash.

The sum of these four products will be the commercial valuation per ton on the basis taken.

Illustration. The table of analyses shows a certain fertilizer to have the following composition: Nitrogen 2.00 per cent; Available phosphoric acid 8.50 per cent; Insoluble phosphoric acid 3.50 per cent; Potash 3.25 per cent. The valuation in this case will be computed thus:

Nitrogen,	$3.5 \times 2.00,$	\$7 00
Available phosphoric acid,	$.8 \times 8.50,$	6 80
Insoluble phosphoric acid,	$0.4 \times 3.50,$	1 40
Potash,	$1.0 \times 3.25,$	3 25

Valuation per ton,	\$18 45
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Since this rule assumes all the nitrogen to be organic and all the potash to be in the form of the sulphate, it is evident that the valuations thus calculated must not be taken as the only guide in the choice of a fertilizer. At best the valuations can only serve to show the approximate cost of the several ingredients contained in the fertilizer in question. In every case the farmer should consider the needs of his soil before he begins to consider the cost. In many instances a little careful experimenting will show him that materials containing either nitrogen, potash, or phosphoric acid alone will serve his purpose as fully as a "complete fertilizer," in which he must pay for all three constituents, whether needed or not.

FREE ANALYSIS OF FEEDS, FOODS, FERTILIZERS, AND SEEDS.

The Station takes pains to obtain for analysis samples of all brands of fertilizers and feeding stuffs coming under the law. It also draws samples of agricultural seeds and foods in the hands of dealers. The co-operation of dealers and consumers is, however, essential for the full and timely protection of their interests.

Foods. Dealers and consumers are invited to send by pre-paid express original and unbroken packages of food materials on sale in Maine of whose purity they are for any reasons suspicious. As prompt free analysis will be made of such samples as circumstances will allow.

Feeding Stuff. The Station will promptly analyze samples of feeding stuffs sold in Maine taken in accordance with directions which will be furnished on application. The results will be reported without charge to interested parties. This applies to dealers and consumers alike.

Commercial Fertilizers. It is difficult to draw accurate samples of commercial fertilizers. On this account it is only in rare instances that the Station undertakes analyses of fertilizers other than the samples collected by its representatives. In case there is special reason for an examination, the Station invites correspondence on the subject.

Agricultural Seeds. Samples of agricultural seeds on sale in Maine, taken in accordance with directions which can be obtained on application to the Station, will be examined as promptly as possible and the results reported free of charge.

In all cases samples should be accompanied by a full description of the goods, including the name and address of the dealer and the sender. Small samples other than liquids can be forwarded by mail. Others should be forwarded by express, charges prepaid. Both mail and express matter should be addressed to the

AGRICULTURAL EXPERIMENT STATION,
Orono, Maine.